

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-14. (Cancelled).

Claim 15. (Currently Amended): A method of producing a solid carbonaceous product C_xH_y , wherein x and y are the average number of carbon and hydrogen atoms respectively and the ratio of x:y is greater than 2.5:1, comprising: wherein heating a hydrocarbon fuel comprising bulk feedstock fuel and flame fuel is heated in the presence of oxygen with oxygen at a C:O stoichiometric ratio greater than 1:0.4, to a temperature of at least about 1000°C, to thereby effect incomplete combustion and partial pyrolytic decomposition of said hydrocarbon fuel, and so as to produce as said solid carbonaceous product C_xH_y , wherein said solid carbonaceous product has a C:H stoichiometric ratio of greater than 2.5:1.

Claim 16. (Currently Amended): The method of as claimed in Claim 15, wherein said the value of x in the x:y ratio C:H stoichiometric ratio exceeds 40:1.

Claim 17. (Currently Amended): The method of as claimed in Claim 15, wherein said method comprisesing: at least the steps of pre-heating said the bulk feedstock fuel, and passing said bulk feedstock fuel into a reactor, wherein in which said bulk feedstock fuel is rapidly heated to a temperature of between about 1000 and 2000°C for between 0.1 and 10 seconds by interspersing said bulk feedstock fuel with air or oxygen assisted hydrocarbon flames generated by reaction of utilizing said flame fuel with oxygen or air, to obtain localized heating and to thereby effect partial pyrolytic decomposition.

Claim 18. (Currently Amended): The method of as claimed in Claim 17, wherein said hydrocarbon flames are generated by reaction of the flame fuel with oxygenare oxygen assisted.

Claim 19. (Currently Amended): The method ~~of as claimed in~~ Claim 15, wherein said bulk feedstock fuel and said flame fuel are the same or different, and wherein said temperature of at least about 1000°C is achieved by combustion of the flame fuel which is mixed with, or separate to, the bulk feedstock fuel.

Claim 20. (Currently Amended): The method ~~of as claimed in~~ Claim 19, wherein said bulk feedstock fuel and said flame fuel are the same or different and are mixed together, and wherein said temperature of at least about 1000°C is achieved by ignition of the hydrocarbon fuel causing localized combustion of said the flame fuel within said bulk feedstock fuel.

Claim 21. (Currently Amended): The method ~~of as claimed in~~ Claim 15, wherein the combustion products are interspersed with said the feedstock fuel by the use of turbulence.

Claim 22. (Currently Amended): The method ~~of as claimed in~~ Claim 21, wherein said turbulence is achieved by introducing one or more of at the flame, combustion products, flame gas, oxidizer, hydrocarbon fuel or feedstock fuel into at the reactor at a velocity of 20-200m/s.

Claim 23. (Currently Amended): The method ~~of as claimed in~~ Claim 15, wherein said the feedstock fuel comprises ~~is comprised~~ of one or more gaseous hydrocarbons.

Claim 24. (Currently Amended): The method ~~as of claimed in~~ Claim 15, wherein said the feedstock fuel is natural gas.

Claim 25. (Currently Amended): The solid carbonaceous product obtainable by the method ~~of described in~~ Claim 15.

Claim 26. (Currently Amended): The method ~~of as claimed in~~ Claim 15, wherein a hydrogen-rich gas with a H:C stoichiometric ratio equal to or exceeding 20:1, and a H:O stoichiometric ratio greater or equal to 5:1 is produced.

Claim 27. (Currently Amended): A~~The~~ method of combustion comprising, combusting ~~wherein~~ the hydrogen-rich gas produced according to the method of Claim 26 ~~is~~ combusted.

Claim 28. (Cancelled)

Claim 29. (Currently Amended): The method ~~of as claimed in~~ Claim 15, wherein said hydrocarbon fuel is heated in the presence of with oxygen at a C:O stoichiometric ratio greater than or equal to 1:0.2.

Claim 30. (Currently Amended): The method ~~of as claimed in~~ Claim 26, wherein said hydrocarbon fuel is heated in the presence of with oxygen at a C:O stoichiometric ratio greater than or equal to 1:0.2.